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ABSTRACT

‘The Role and Responsibilities of the Australian Ordnance Council in the Procurement of Weapons and Weapon Systems for the Australian Defence Force’

The Australian Defence Force (ADF) is required to operate effectively and continuously in some of the harshest environments in the world. Consequently, the ADF must have confidence that its weapons and weapon systems are both safe to operate and that they can withstand operations in these environments over their service life. The Australian Ordnance Council (AOC) conducts design safety and suitability for service assessments for the ADF to ensure these requirements are met. This paper outlines:

- a. the need for the ADF to have an organisation like the AOC,
- b. the position of the AOC in the ADF procurement process, and
- c. the ADF’s test and data requirements for the introduction into service of foreign designed weapons and systems.

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‘THE ROLE AND RESPONSIBILITIES OF THE AUSTRALIAN ORDNANCE COUNCIL IN THE PROCUREMENT OF WEAPONS AND WEAPON SYSTEMS FOR THE AUSTRALIAN DEFENCE FORCE’

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1. The Australian Defence Force (ADF) is required to operate effectively and continuously in some of the harshest environments in the world. Consequently, the ADF must have confidence that its weapons and weapon systems are both safe to operate and that they remain so during operations in these environments over their required service life. The Australian Ordnance Council (AOC) conducts design safety and suitability for service assessments for the ADF to ensure these exacting requirements are met. This paper outlines:
 - a. the need for the ADF to have an organisation like the AOC;
 - b. the position of the AOC in the ADF procurement process; and
 - c. the ADF’s design and test data requirements, and reasons for those requirements, for the introduction into service of foreign designed weapons and systems.

The ADF’s Need for an AOC Organisation

2. The ADF must be confident that, when it introduces a new weapon or weapon system into service, it meets required standards of safety and will continue to do so over its agreed service life. Additionally, we must be confident that safe functioning and operation will not be unacceptably degraded by the service environment over this service life. This service environment not only includes consideration of temperature and humidity extremes, but also induced environments such as vibration, rf radiation and external threats and hazards. This process is known as the S³ assessment process and is conducted by the AOC.
3. The ADF maintains this capability for two major reasons:
 - a. Firstly, the environment that the ADF is likely to operate in, as defined in higher defence policy, may be different from the environment tested by other nations. An example of this is the traditional NATO preference to test to a severe cold environment, perhaps typical of operations in northern central Europe. However, the ADF is more likely to be operating in a very hot and humid environment, typified by northern Australia or south east Asia. Experience has shown that the extremes of this environment are not necessarily tested by all NATO weapons suppliers. Additionally, specific threats and hazards may be likely for ADF units, and these may not have been considered as likely threats and hazards by other military organisations. Consequently, to ensure the ADF can continue to operate

confidently and safely in these environments, the extremes of these environments, and the perceived threats and hazards, must be considered and, if necessary, tested.

- b. The second reason that the ADF maintains the AOC capability is that it assists the ADF in remaining a 'clever customer'; that is, being in a position, unlike a number of nations with similar sized defence budgets, to be able to independently, of either manufacturer or government supplier, verify both adherence to established design safety requirements specified by the supply contract, as well as claims of continued safe performance when subjected to a specified environment. Additionally, since the S³ process includes an assessment of service life in ADF conditions, considerable cost savings over the weapon's life may be realised before replacement is necessary. Alternatively, a reduced life over that promulgated by a supplier may reduce risk from safety related problems.
4. One advantage of the AOC's current role relates to the 'duty of care' that employers must provide with respect to safety. In Australia this is legislated by the Federal Occupational Health and Safety Act which, undoubtedly, has its equivalents in other countries. In Australia, legal advice suggests that, as a general rule, the Defence Force personnel, in peacetime, can no longer be exposed to greater safety risks than other non-defence workers. Consequently, the Federal Government now has to ensure that the risk of injury or death is 'as low as reasonably practicable'. By having an organisation such as the AOC, which is independent of the pressures of operational staffs, the ADF is demonstrating its commitment, not only to system safety, but also to personnel safety.
5. In summary, the AOC assists by ensuring the ADF gets 'value for money' at an acceptably low level of risk to system and personnel safety.

AOC's Position in the Procurement Process

6. The assessment of a store's safety and suitability for service must be an integral part of the introduction into service process. For major equipment buys this process is managed by a dedicated project office and includes other important introduction into service issues such as engineering integration onto a platform, if appropriate, definition of logistics management plans, and development of operational doctrine.
7. However, to ensure that any design safety problems with the store are identified prior to ADF commitment to buy is given, AOC involvement should occur at the stage where probable contenders for supply have been identified. A design safety assessment can then be made and possible design faults identified and rectified if appropriate. Analysis of available design data at this early stage may also assist in discriminating between possible contenders, where design limitations may preclude the product from satisfactorily completing the remainder of the S³ assessment process.
8. Unfortunately, current commercial supply practices usually limit the availability of test data prior to signing of contracts. While this is less than ideal, the risk of an item being

introduced into service, which is not safe and suitable, can sometimes be limited based on available technical data, previous experience with the supplier, or exchange of data on the store with an allied military organisation. Notwithstanding, if manufacturers and suppliers have both confidence in their products and a desire to sell them, commercial practices should change such that this information is provided as part of the request for tender process.

9. Early involvement at the contract stage can significantly reduce, or even eliminate, the need for in-country testing of the store, by incorporating into the contract the requirement to supply design data, safety and hazard analyses, and the results of environmental and safety testing already conducted. This testing may have been conducted either by the manufacturer, and verified by some type of accreditation process, or be made available by an organisation similar to the AOC, within an allied military organisation.

10. Consequently, early involvement of the AOC in a weapons project at the contract stage, including the provision of appropriate data, has benefits to the ADF in reducing:

- a. the risk of the ADF purchasing a store that does not meet design safety requirements, and
- b. the cost of necessary testing prior to introduction of the item into service.

ADF's Design and Test Data Requirements for Foreign Sourced Weapons and Systems

11. Both design and test data are required for a full S³ assessment. Design data are required for any safety assessment, where the design would be compared with established design safety principles. Any design data provided to the ADF remains commercially confidential. To assist manufacturers and suppliers the AOC can provide the ADF design safety guidelines for various types of weapons entering ADF service. These documents also describe typical test programs, the results of which are required to complete the assessment.

12. While it has been, and will continue to be, preferable that manufacturer's safety and environmental test results, independently conducted and verified, be provided at the request for tender stage of a contract, they will, in future, be required to be provided as part of supply contracts. For the case where weapons and stores are developed and produced in Australia, the AOC can be, and is, involved in developing test programs. However, for internationally procured weapons and stores, local test programs may have been completed some years prior to ADF involvement. However, even with the availability of only limited test results from previously completed safety and environmental trials, the areas where those test programs differ from the ADF environment can be determined and, if necessary, tested.

13. Typically, necessary test data should include:

- a. transport vibration testing, which is in addition to air carriage vibration testing, for air, sea and road transportation;

- b. non-repetitive shock testing, such as a 1.5 m and 12 m drop test;
- c. constant high temperature testing, and high and low temperature cycling, including variations in humidity;
- d. low pressure and rapid pressure change testing; and
- e. thermal shock testing.

These tests would usually be conducted to internationally recognised testing standards such as MIL-STD-810 OR DEF STAN 07-55.

14. A number of the following test results should also be supplied, dependant on the store's likely operational environment. To meet the ADF policy of procuring insensitive munitions (IM) weapons where possible, these results should include tests for characteristics of IM. Testing may include, but is not limited to:

- a. aerodynamic heating,
- b. salt atmosphere testing,
- c. hail, dust, sand and icing,
- d. fast and slow cook-off testing,
- e. bullet impact and fragment attack, and
- f. sympathetic detonation.

Summary

15. The AOC provides the ADF with the unique capability to ensure that weapons and systems introduced into service meet required standards of safety and that this safe functioning and operation will not be unacceptably degraded by the service environment over the service life. Additionally, by being involved early in the procurement cycle, the cost of testing can be reduced, while still maintaining high safety standards, contributing to reduced program and through-life costs.